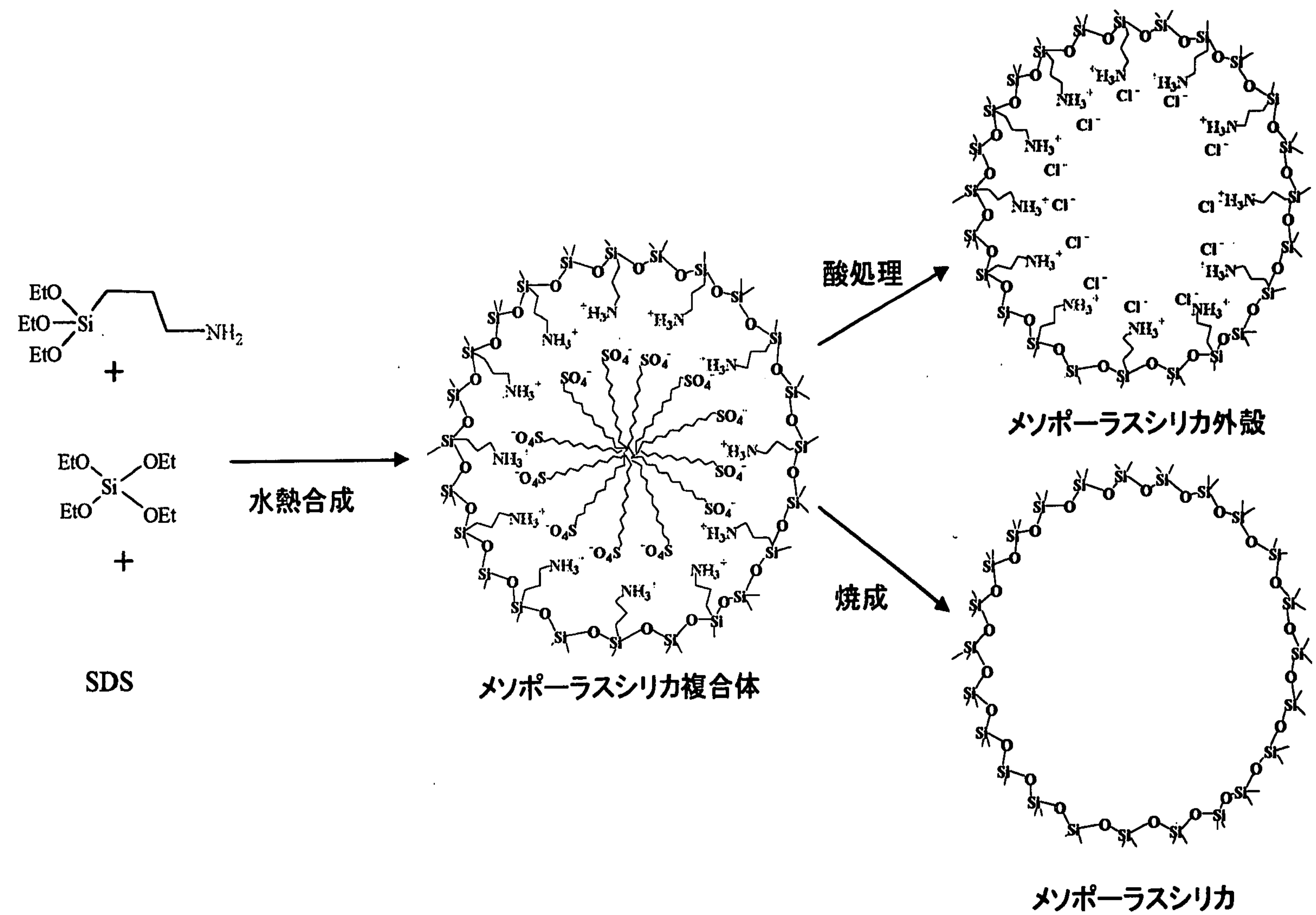
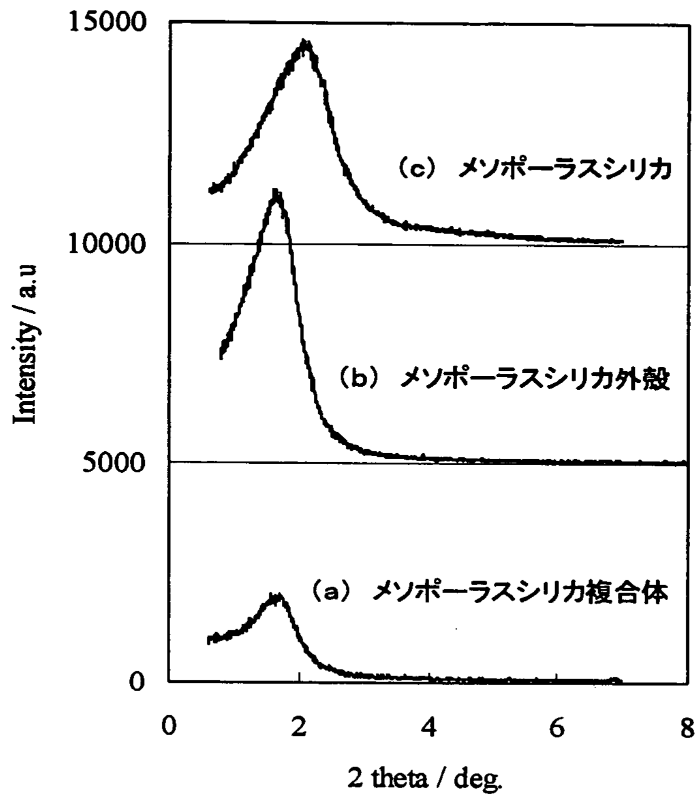
【図1】

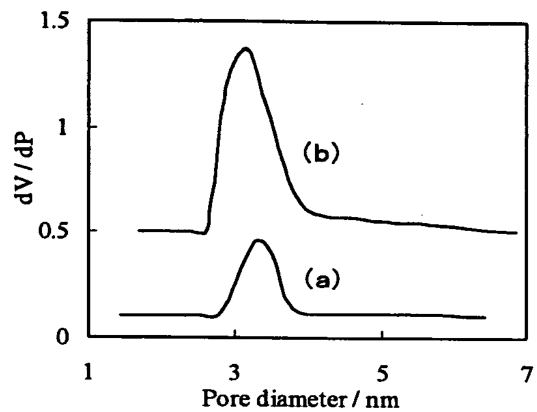

EtO
EtO
EtO
Si
NH2
+
EtO
OEt
Si
EtO
OEt
+
SDS
水熱合成
メソポーラスシリカ複合体
酸処理
焼成
メソポーラスシリカ外殻
メソポーラスシリカ

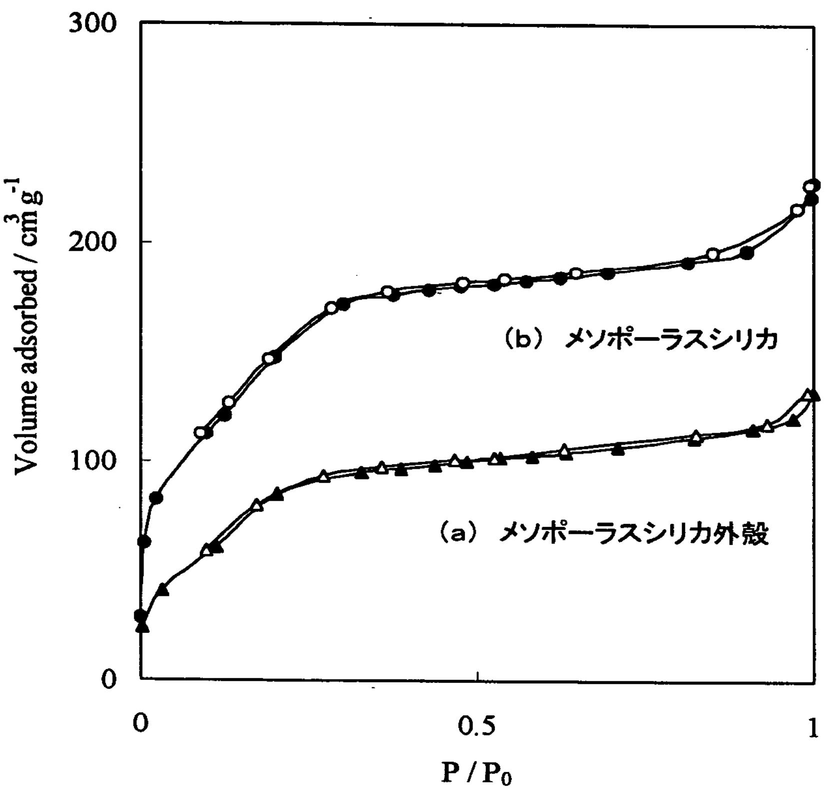
【図2】


15000
10000
5000
0
Intensity / a.u
(c) メソポーラスシリカ
(b) メソポーラスシリカ外殻
(a) メソポーラスシリカ複合体
0
2
4
6
8
2 theta / deg.

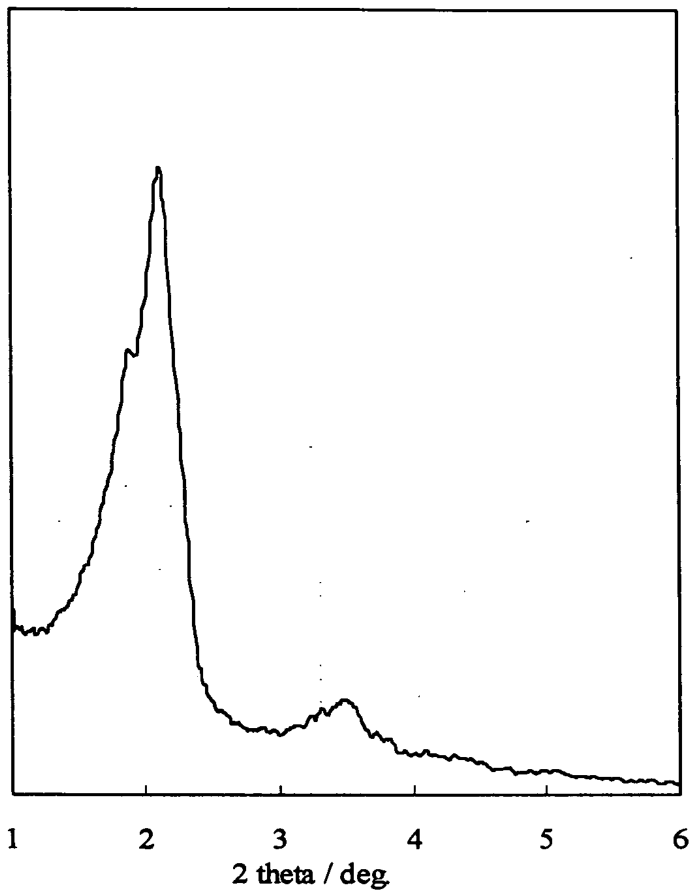
DF4392/US

【図3】


1.5
1
0.5
0
dV / dP
(b)
(a)
1
3
5
7
Pore diameter / nm


300
200
100
0
Volume adsorbed / cm3g-1
(b) メソポーラスシリカ
(a) メソポーラスシリカ外殻
0
0.5
1
P / P0

【図4】



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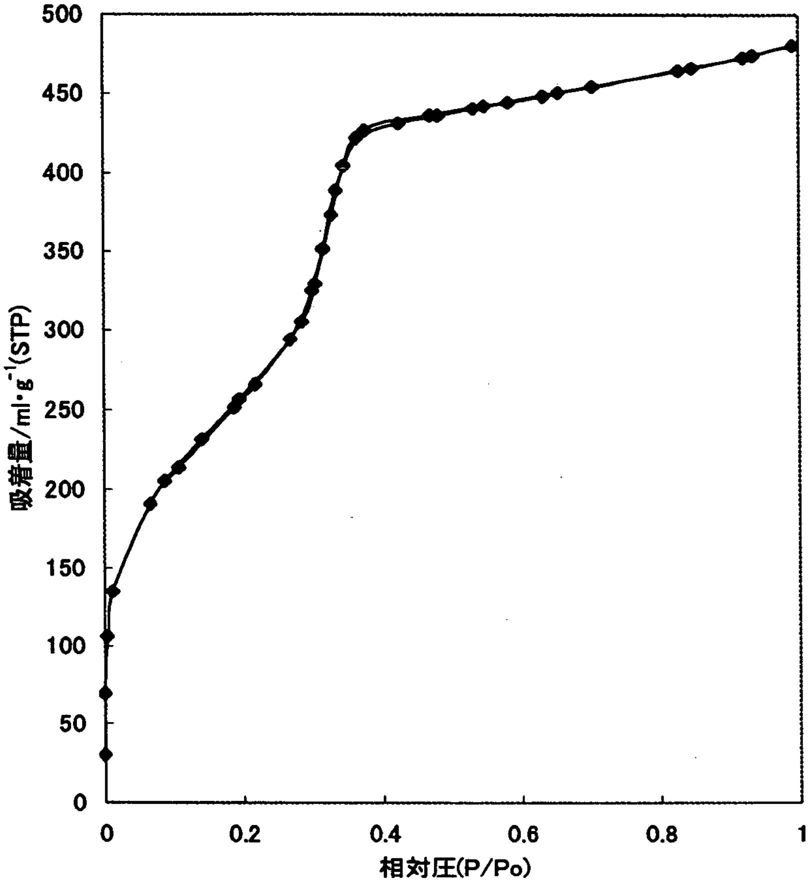
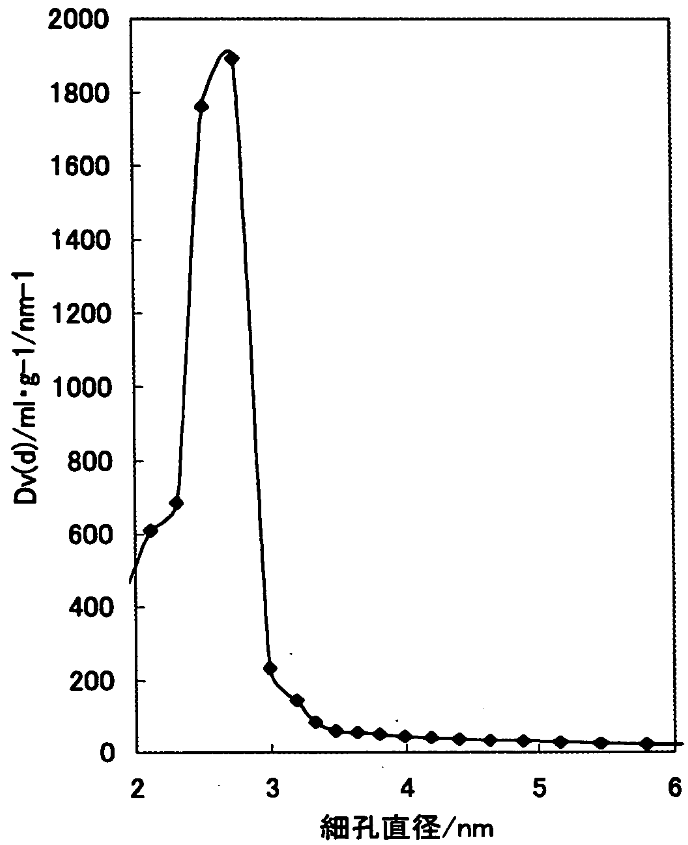
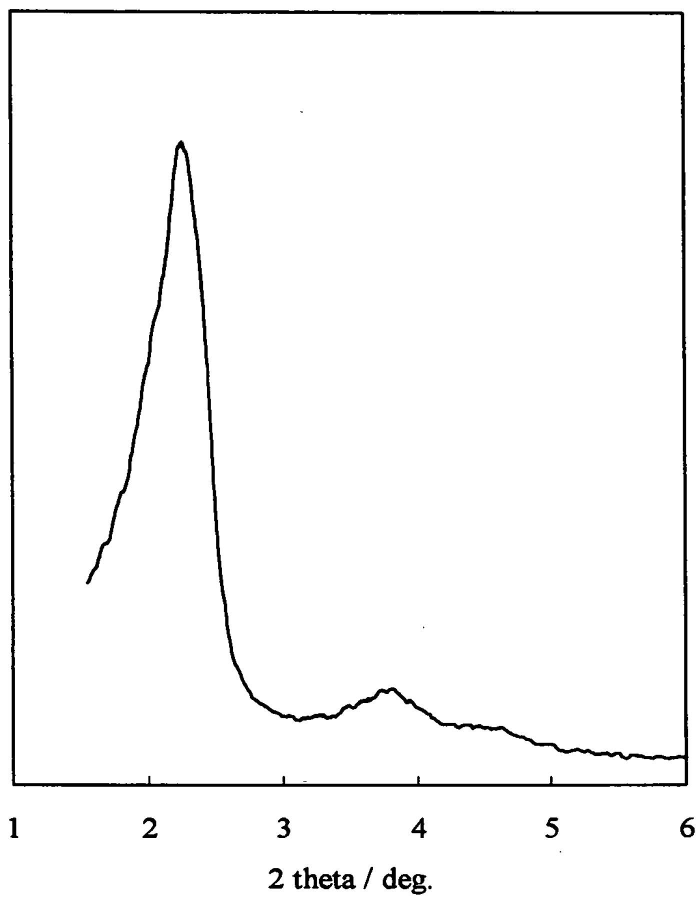
【図5】


500
450
400
350
300
250
200
150
100
50
0
吸着量/ml·g⁻¹(STP)
0
0.2
0.4
0.6
0.8
1
相対圧(P/Po)

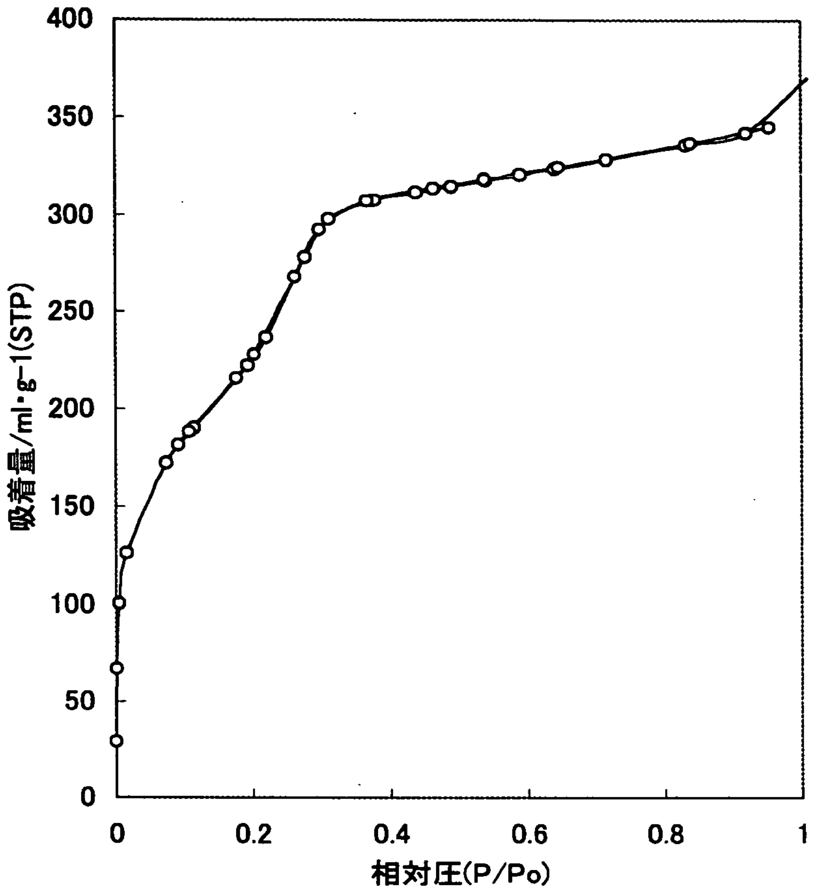
【図6】


2000
1800
1600
1400
1200
1000
800
600
400
200
0
Dv(d)/ml・g-1/nm-1
2
3
4
5
6
細孔直径/nm

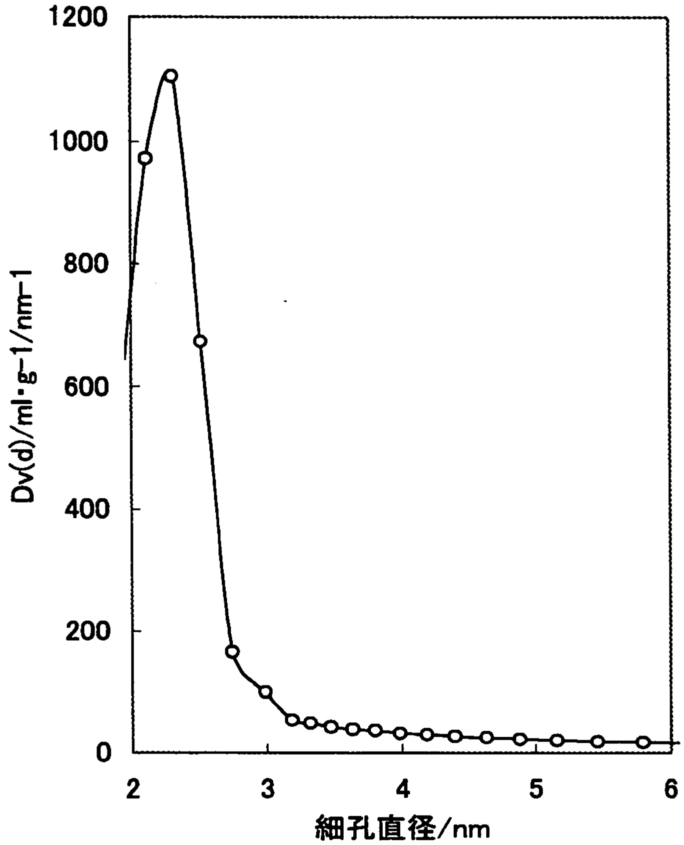
【図7】



【図８】


400
350
300
250
200
150
100
50
0
0
0.2
0.4
0.6
0.8
1
吸着量/ml・g-1(STP)
相対圧(P/Po)

【図9】



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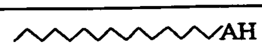
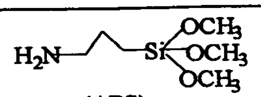
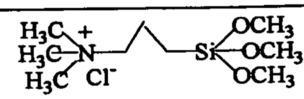
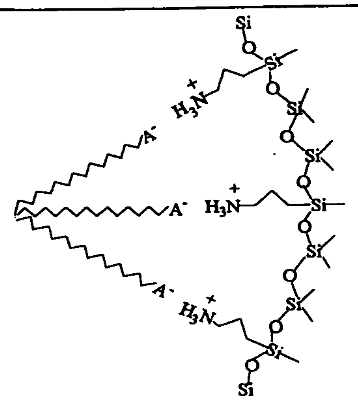
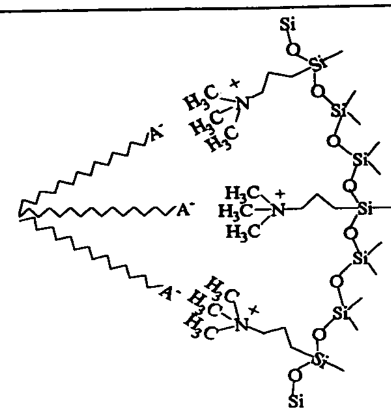
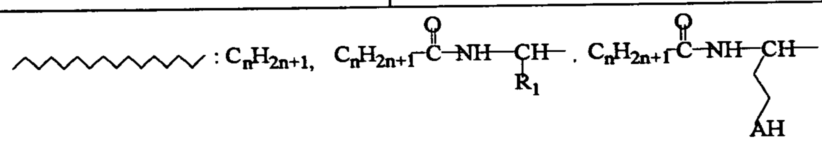
	Neutralization	Double decomposition
Surfactant		
CSDA	 (APS)	 (TMAPS)
Interaction		
	 A: COO, OSO_3, SO_3, OPO_3; M^+: Na^+, K^+, NH_3^+— etc.; R_1: H, CH_3; n = 8 - 18;	

Fig. 10. Schematic illustration of the two types of amino group-anionic surfactant head group interactions: through neutralization of acid with primary aminosilane APS and double decomposition of negatively charged anionic salt surfactant with positively charged quaternized aminosilane TMAPS.

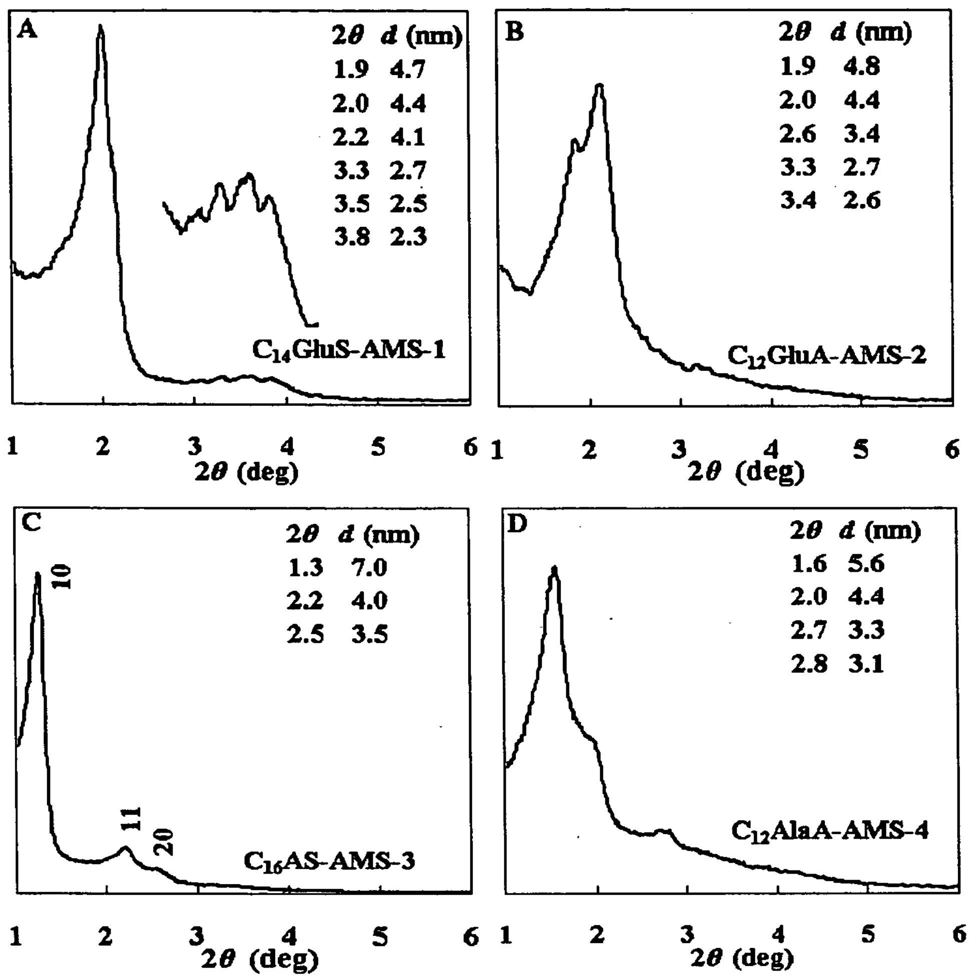


Fig. 11. XRD patterns of cacined AMS-n mesoporous silica. The chemical mol composition of the reaction mixture was (A) C_{14}GluS-AMS-1, C_{14}GluS:TMAPS:TEOS:H_2O 1:2:10:2405 (at 100 °C for 3 d); (B) C_{12}GluA-AMS-2: C_{12}GluA:APS:TEOS:H_2O 1:2.5:18.5:1905 (at 100 °C for 2 d); (C) C_{16}AS-AMS-3: C_{16}AS:TMAPS:TEOS:H_2O 1:1:9:1544 (at 60 °C for 1 d); (D) C_{12}AlaA-AMS-4,

C_{12}AlaA:APS:TEOS:H_2O 1:0.75:7.5:1505 (at 60 °C for 1 d). XRD patterns were recorded on an MX Labo powder diffractometer equipped with Cu Kα radiation (40 kV, 20 mA) at the rate of 1.0 deg/min over the range of 1.5 – 10.0 ° (2θ).

Supp rting n line materials:

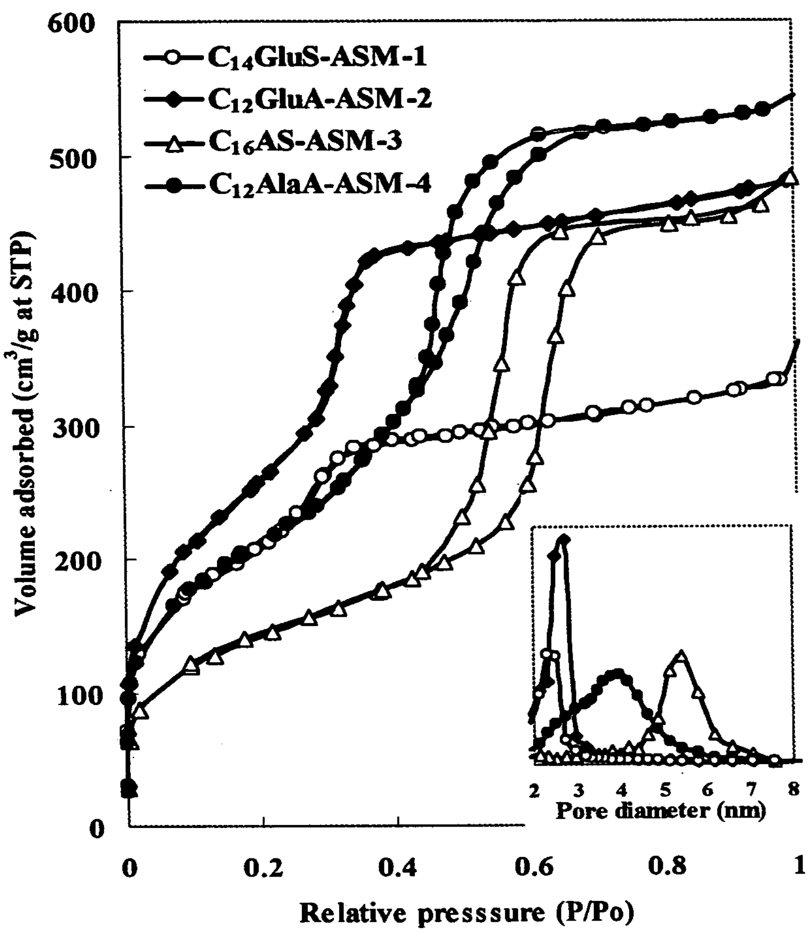


Fig. 12. N_2 adsorption-desorption isotherms and BJH pore size distributions of AMS-n mesoporus silica shown in Fig. 11. The isotherms were measured at -196 °C on a Belsorp 28SA sorptionmeter.

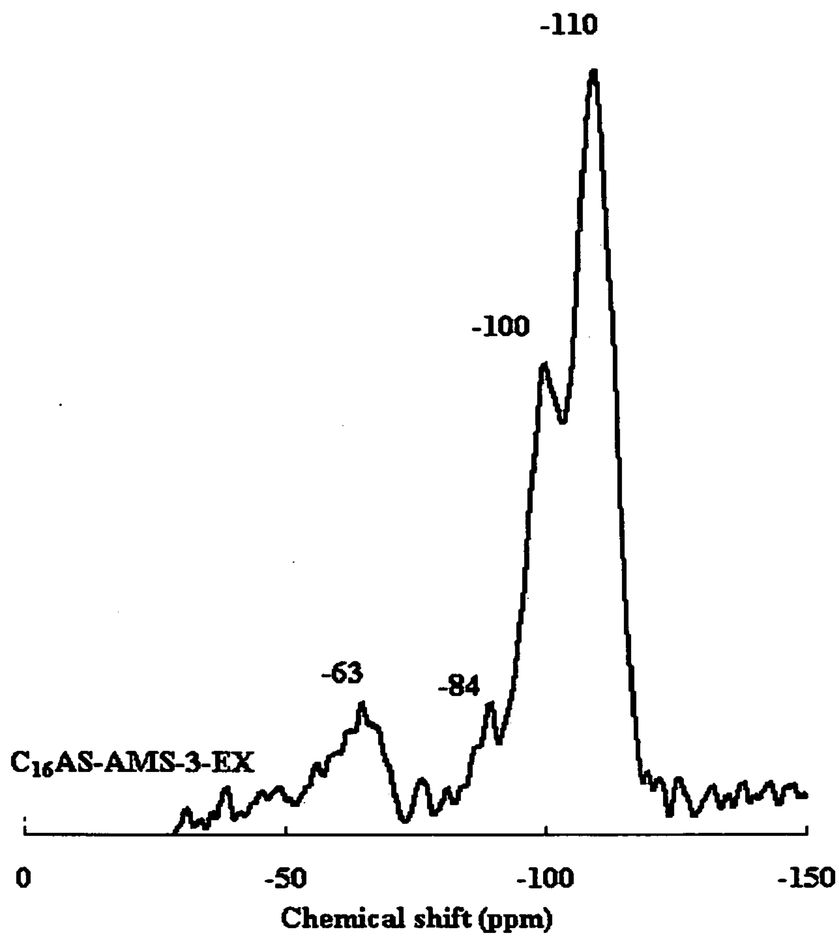


Fig. 13 shows CP ^{29}Si NMR spectra of extracted AMS-3 silica C_{16}AS-AMS-3-Ex. The spectra were collected at a JEOL-LA400WB 400 MHz spectrometer at 79.4 MHz and a sample spinning frequency of 5 kHz, respectively.